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(58) Field of Search
   UK CL (Edition O) H4K KBNJ KFH
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(54) **Communications addressing network**

(57)   A communications addressing network (100) includes a communication terminal (101) and at least a first network node (103) for communicating between a first communication terminal (101) and a second communication terminal (105). This communications addressing network (100) allows a calling user to create a communication request for communicating to the second communication terminal (105). The communication request includes commonly known information such as an end users name, an organization that the end user is associated with and a type of service used to communicate.
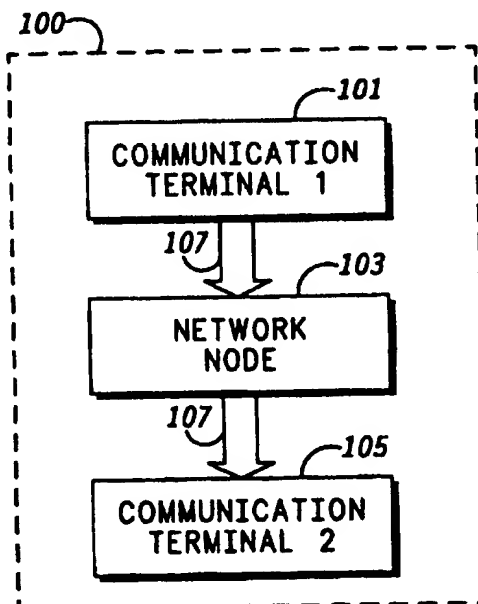
FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.
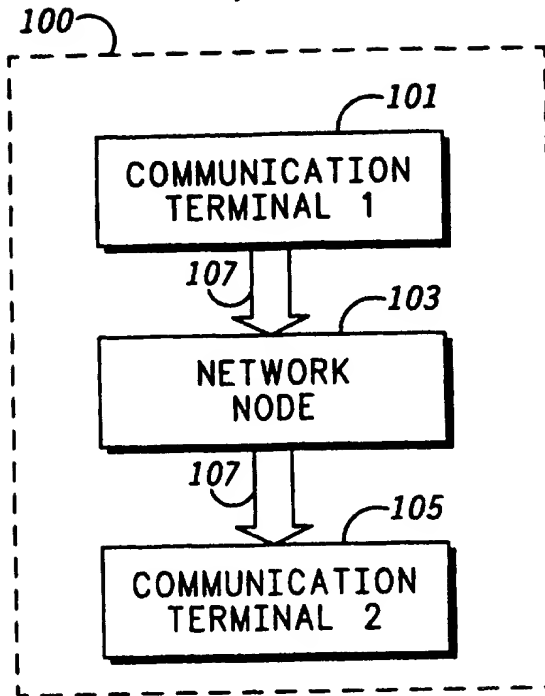
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FIG. 1

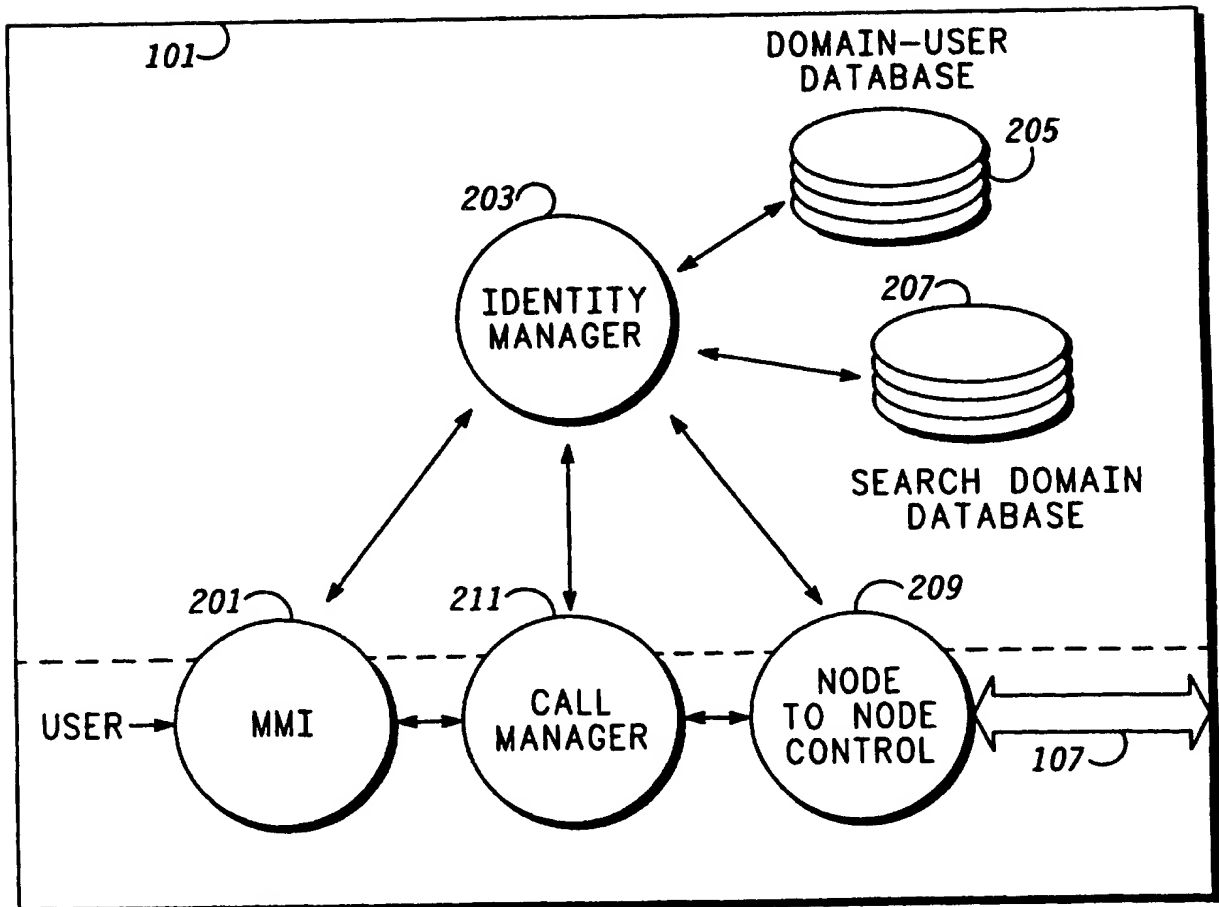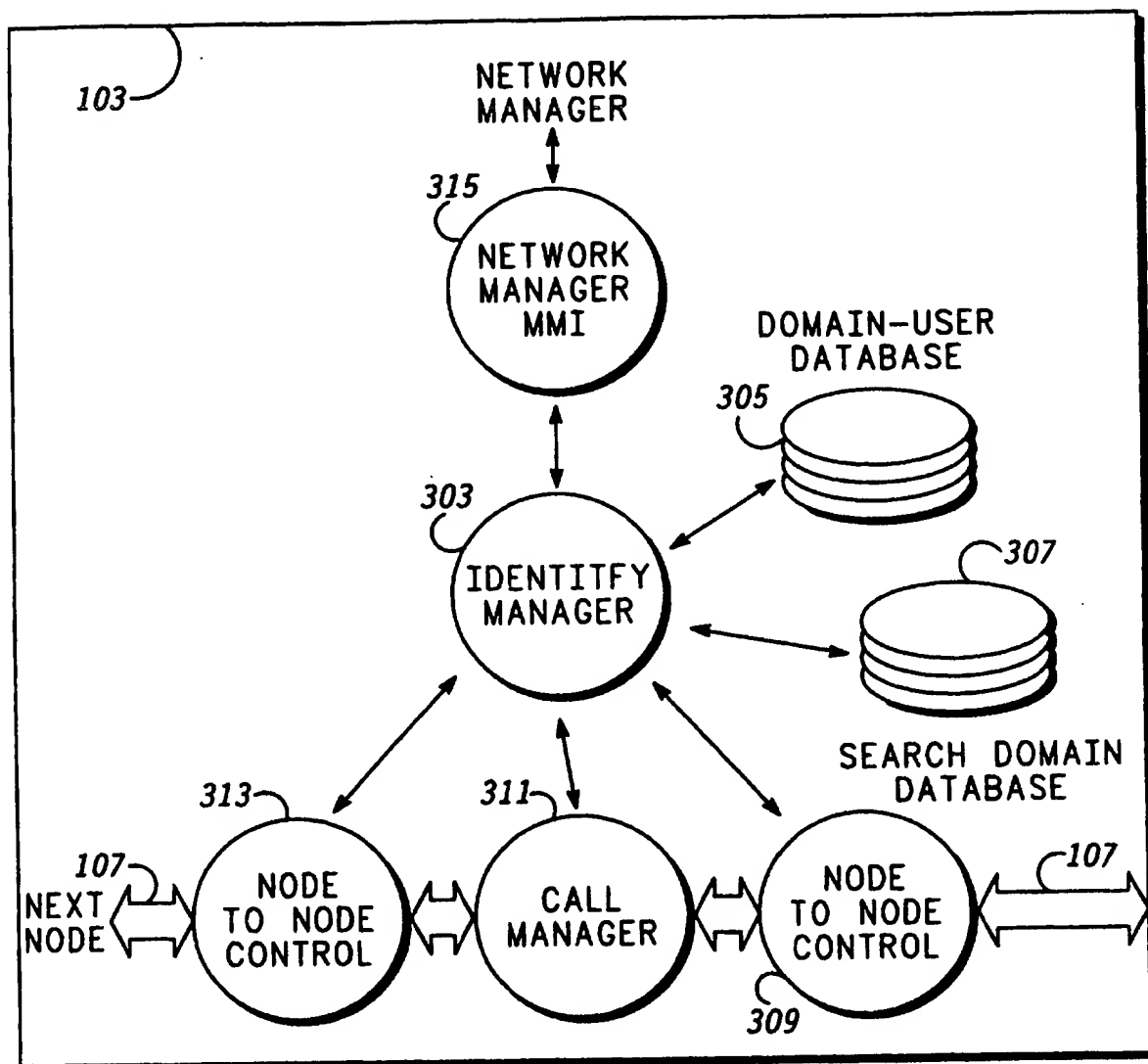

FIG. 2

103

NETWORK
MANAGER

315

NETWORK
MANAGER
MMI

DOMAIN-USER
DATABASE

305

303

IDENTITFY
MANAGER

307

313

311

NODE
TO NODE
CONTROL

CALL
MANAGER

SEARCH DOMAIN
DATABASE

NODE
TO NODE
CONTROL

107
NEXT
NODE

107

309

FIG. 3

FIG. 4

CALLING USER'S TERMINAL

"SEND THIS FILE TO THE MOTOROLA SALES OFFICE IN ARGENTINA"

DOMAIN-USER DATABASE

IDENTITY MANAGER

SEARCH DOMAIN DATABASE

MMI

CALL MANAGER

NODE TO NODE CONTROL

NETWORK NODE 1

NETWORK MANAGER

DOMAIN-USER DATABASE

NETWORK MANAGER MMI

IDENTITY MANAGER

SEARCH DOMAIN DATABASE

NODE TO NODE CONTROL
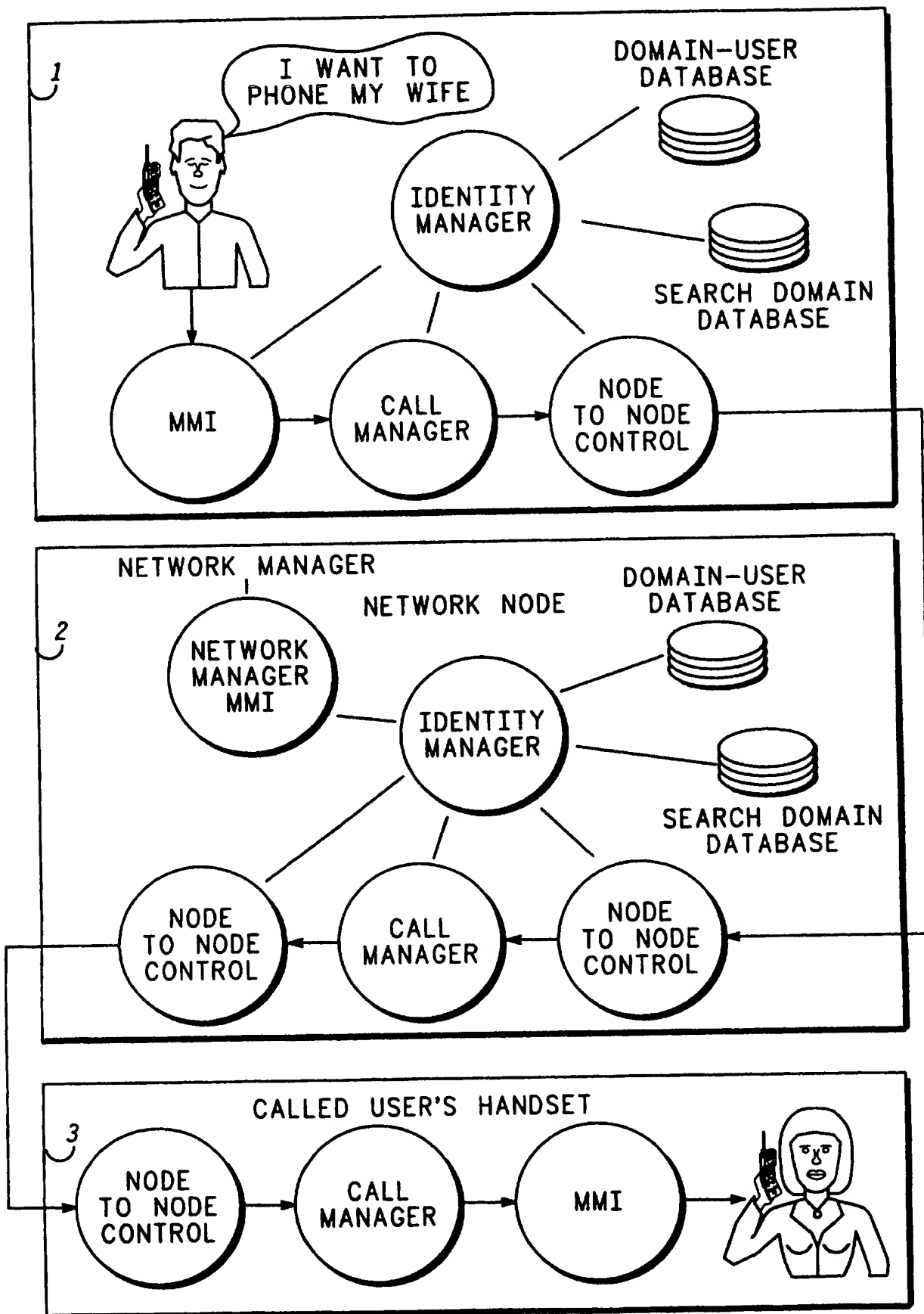
CALL MANAGER
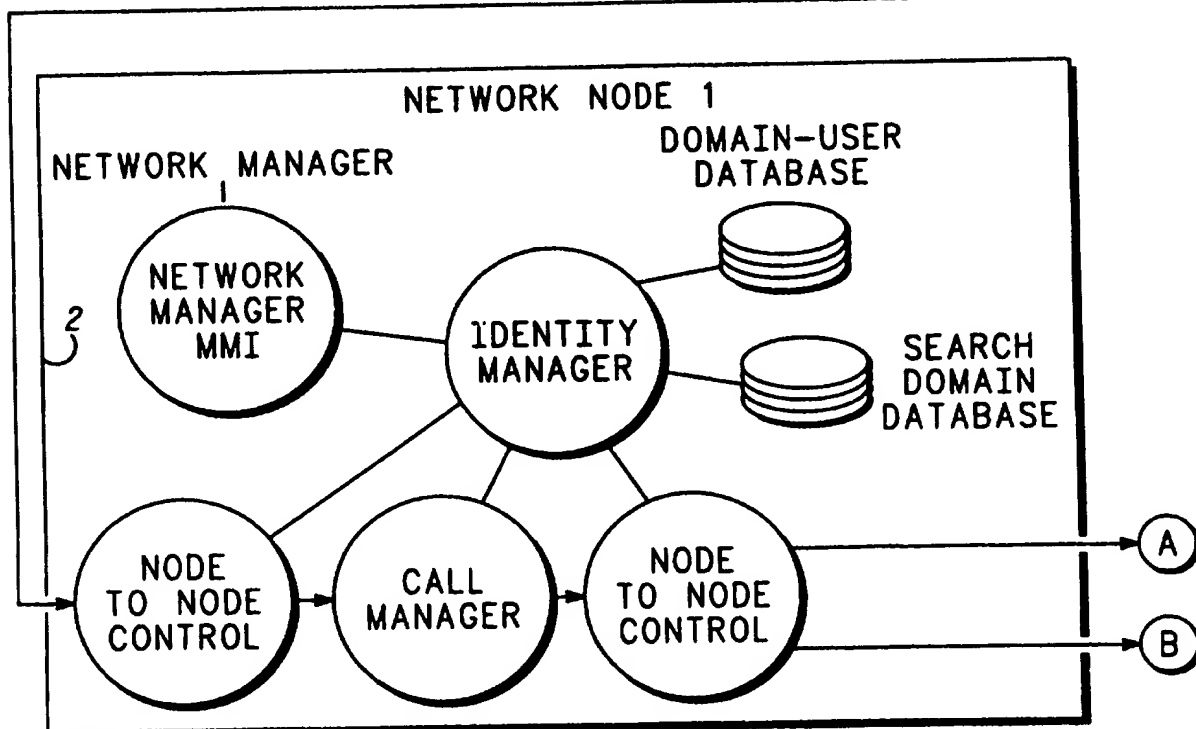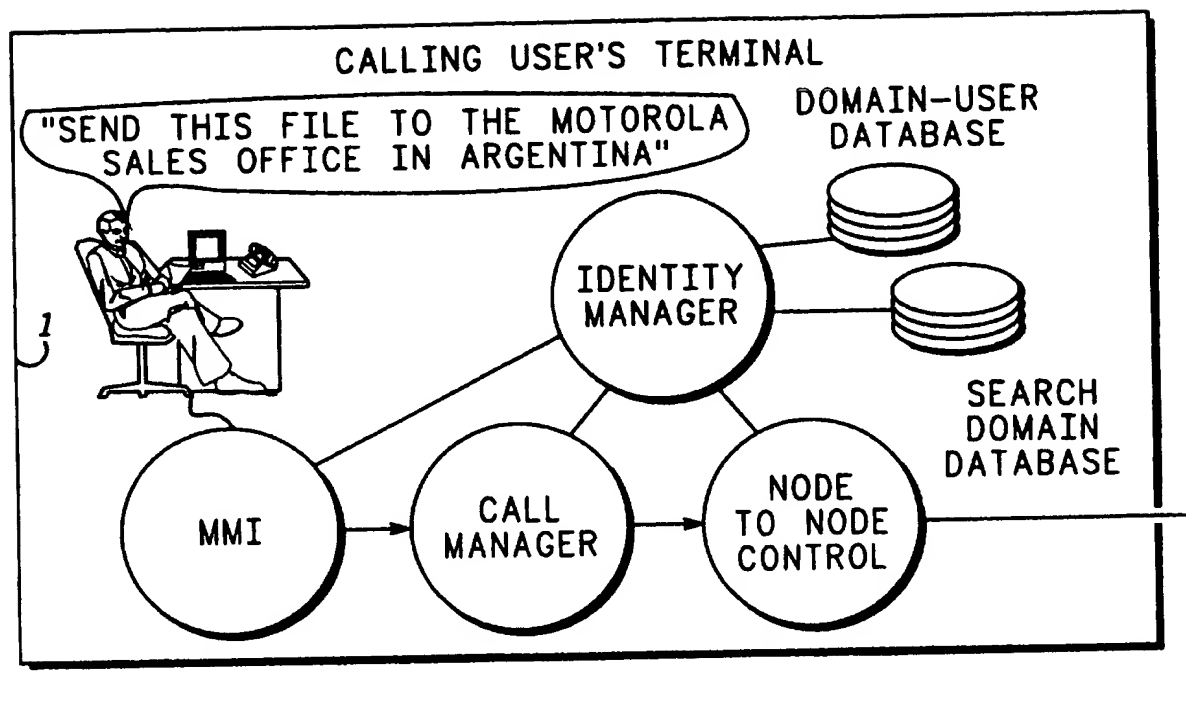
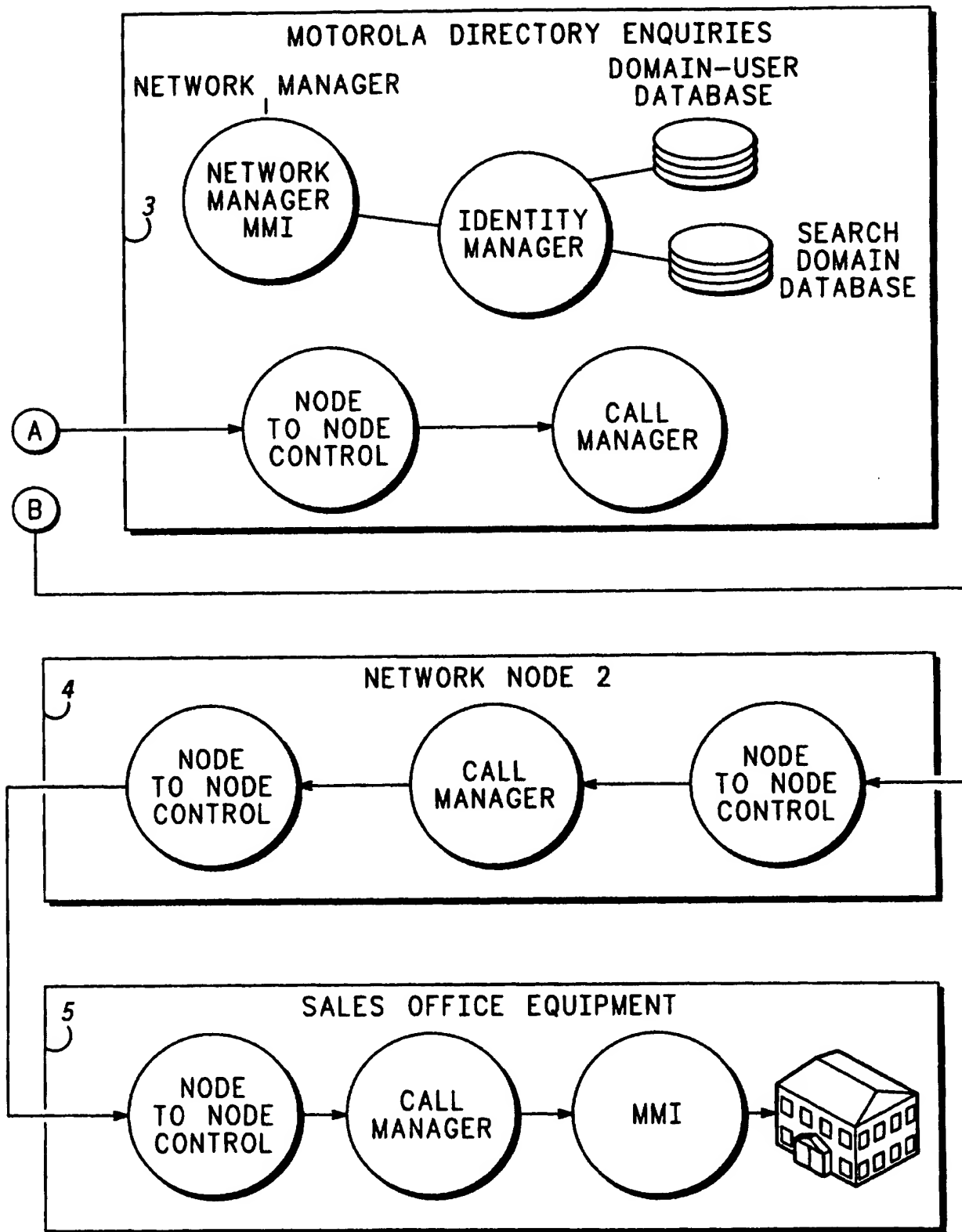NODE TO NODE CONTROL

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FIG. 5

F I G.   5 A

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A COMMUNICATIONS ADDRESSING NETWORK AND TERMINAL THEREFOR

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Field of the Invention

Generally, the present invention concerns communications and more particularly, a unique communications network for providing addressing and communications of multiple services to multiple users.

Background of the Invention

15   Today, there are a large number of communication addressing schemes available. Each addressing scheme requires a new identity for a particular individual, thus, creating an exhaustive list of identities to reach a particular individual. An example of such identities include home telephone number, home fax number, cellular phone number, pager number, work telephone number, work fax number, and internet address.

This list of communication identities creates incredible complexity for a user. First, in order to communicate with an end user the calling user must store and recover the appropriate communication identity for the desired communication service for that particular user. Second, the calling user must be familiar with the different methods of entering the different telecommunication identities such as E-mail and voice

communications. Third, the user may need to change his communication identities as the individual networks grow or identities are reallocated. Thus, it would be desirable for a calling user to be able to communicate to an end user merely by identifying the end user and the service which the calling user wishes to use for his communication. Such a system, if provided, would allow the calling user to operate more efficiently with less frustration by allowing the calling user to forget all of the individual communication identities as well as minimize the methods by which to enter the different communication modes.

Brief Description of the Drawings

FIG. 1 is an illustration in block diagram form of a communications addressing network in accordance with the present invention.

FIG. 2 is an illustration in block diagram form of a communication terminal in accordance with the present invention.

FIG. 3 is an illustration of a network node in accordance with the present invention.

FIG. 4 is an illustration of an example communication scenario in accordance with the present invention.

FIG. 5 is an illustration of an example communication scenario in accordance with the present invention.

Detailed Description of a Preferred Embodiment

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A preferred embodiment of the present invention is an implementation of a communications addressing network including a communication terminal and at least a first network node for communicating between a first communication terminal and a second communication terminal. This communications addressing network allows a calling user to create a communication request for communicating to the second communication terminal. The communication request includes commonly known information such as an end users name, an organization that the end user is associated with and a type of service used to communicate.

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FIG. 1 is an illustration in block diagram form of a communications addressing network 100. The network 100 includes a first communication terminal 101, a network node 103 and a second communications terminal 105. The communication terminals 101, 105 and the network node 103 are interconnected via a communication link 107. This communication addressing network 100 is a simplified illustration of a system that may use the present invention. Other equally sufficient embodiments are included in the scope of the present invention. Other such embodiments include: multiple communication units in excess of two; multiple network nodes; and multiple communication links containing multiple communication terminals and multiple network nodes.

FIG. 2 is a detailed block diagram illustrating a communication terminal such as communication terminal 101. It is understood that the communications terminal can be realized in any one of a multiplicity of devices.

5   Such devices include a telephone, a computer terminal, a personal digital assistant (PDA) or any other communication device that incorporates the below described functions. Alternatively, it is understood that the communication terminal in such a system could have

10   limited functionality, thus, the network nodes would provide all of the addressing capabilities. This would allow the communications addressing network described herein to be accessed by the communication terminals that are available today. In the preferred embodiment,

15   the communication terminal 101 includes a man-machine interface (MMI) 201, an identity manager 203, a domain-user database 205, a search domain database 207, a node to node controller 209 and a call manager 211.

The MMI 201 provides the user with an interface to

20   set up communications and make inquiries about other users. The MMI 201 also provides an interface for the user to modify any of the records stored in the Domain-User database and the Search Domain Database.

The MMI 201 detects the input of a called user identity

25   and creates a communication request. The communication request is generated by converting the input user identity into the required format via voice to text processing, input text processing or some other means as appropriate for the interface and presents this

30   correctly formatted information to the Identity Manager

203 so that the information can be used to identify an appropriate Service Access Point Identification (SAP ID). If a user enters a SAP ID or other routing information directly in association with a communication request (as
5   is normally the case today), the MMI 201 instructs the call manager 211 to set up a communication to the SAP ID or to follow the appropriate routing instructions. Otherwise, the MMI 201 creates a communication request having several fields representing real world information
10   for identifying an end user. These fields might for example include the called user's name (e.g. Bill Robinson), the called users organisation (e.g. Motorola), the called user's address or partial address (e.g. Basingstoke, UK). Alternatively, the called user's identity
15   can be in the form of a key word which is used in association with information about the calling user to identify the called user (e.g. keyword = "wife", Calling user = "Bill Robinson, 15 Wentworth Close"). The identity manager 203 identifies the SAP ID for the end user in
20   response to the communication request from the MMI 201. The identity manager 203 has several resources for identifying the appropriate SAP ID.

The first resource is the domain user database 205 which is a local database created by the communication
25   terminal 101. The domain user database stores individual records for particular users. The identity manager searches this domain-user database and attempts to match the records of the communication request with those contained in the domain user
30   database. This database contains records for each user

known to the first communication terminal 101 and for each communication service for which the user has access. In the preferred embodiment, the contents of the information stored in each record is as follows:

Unique Access Keyword/Calling ID
User Name
Organisation
Access Control Rule
Address
Prioritised Dialable Number(s)
Present Domain ID
Service
Charging Information
Prioritised list of Gateway Domains
SAP ID
Routing Path

Essentially, the Domain-User Database allows a variable set of fields to be used as keys to match against a complete record stored in the database. When a match is found, the complete matching record(s) is(are) returned. The purpose of the Domain-User Database is to provide the communication terminal with the information it needs to match the called user's identity and retrieve a SAP ID or alternative identity (e.g. routing path) to allow the system to route a communication to the required destination. In addition, the database contains information which will allow a matching of the desired communication service to a communication service

provided by the called user's communication terminal. The database contains a number of additional items of information which are used to support specific telecommunications capabilities, such as mobility and

5   calling user restriction. A description of the use of each of these fields can be found in later paragraphs.

If an appropriate SAP ID is located, the identity manager 203 utilises the call manager 211 to initiate a communication from the first communication terminal

10   101 to the second communication terminal 105. Additionally, the call manager 211 performs all the normal call related processing (routing, call state management, billing functions, etc.) as would be found in any existing communications system.

15   If no SAP ID is found in the domain-user database 205, then a search is performed in the search domain database 207, also local to the first communication terminal 101. The search domain database 207 contains records for alternative communication domains where it

20   may be possible to locate a SAP ID for the desired end user. Essentially, the Search Domain Database 207 allows a variable number of fields to be used as keys to match against a complete record stored in the database. When a match is found, the complete matching record(s) is(are)

25   returned. This database 207 contains a record for each alternative communications domain where it may be possible to locate a record for the called users and the specific service. For example, the database 207 may contain a SAP ID or routing information to the US on-line

30   directory inquiries service, or Motorola's on-line

directory service, etc.. In the preferred embodiment, the contents of the information stored in each record is as follows:

5 Unique Access Keyword
Access code for alternative Domain Databases (e.g. SAP ID of alternative node)
Service   .
Charging Information

10

Once a search database is identified by the search domain database 207, the identity manager 203 utilises the node to node controller 209 for communicating to remote network nodes on the communication link 107. 15 The remote network nodes provide similar searching in remote network's domain user databases and search domain databases for these remote networks. The remote network nodes provide one of three services: one, they will communicate the appropriate SAP ID back to 20 the first communication terminal 101; two, they will set up a communication between the first communication terminal 101 and the second communication terminal 103 identified by the desired SAP ID; or three, if an appropriate SAP ID is not identified then they will 25 communicate a communication request to a second remote network node (not shown in FIG. 2). This second remote network node will provide the same functionality as the first remote network node.

FIG. 3 is a detailed illustration of the network node 30 103 of FIG. 1. The network node 103 includes an identity

manager 303, a domain user database 305, a search
domain database 307, two network node controllers 309,
313, a call manager 311 and a network manger interface
(NMI) 315.   The network node 103 works in much the

5   same way as the communication terminal, with the
following differences.   First, the network node 103
receives communication requests from communication
terminals via the communication link 107.   Second, the
network node 103 includes the NMI 315.   The NMI

10   provides a network manager with an interface through
which he may modify any of the records stored in either
the Domain-User Database or the Search Domain Database
in a remote node. Through this interface, the network
manager is able to, for example, change the SAP ID for a

15   given user because he has moved to a new location,
change the complete numbering plan for a given
network, add or remove records for external sources
which might provide information about how the called
user may be reached.

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To illustrate the capabilities of this invention, two call set
up scenarios are described below.

Scenario 1 : Set up a call to a called user who the caller

25   regularly calls

In this simple scenario, illustrated in FIG. 4, one user calls
another user on the same system. The calling user has an
communication terminal in accordance with this

30   invention and because he regularly calls the called user

he has configured the domain user database in his terminal to match a key word with the called user's SAP ID. The sequence of events for scenario 1 is as follows:

1.i   The calling user speaks the words "I want to phone my wife" into his handset.

1.ii   The MMI in the handset contains a speech recognition capability and generates the spoken phrase as a text string.

1.iii   The MMI contains a text string parser, which scans the text string and re-formats the information into a message with at least the following fields:

Service = Voice Telephony

Called User Keyword = Wife

This interpretation is presented to the user for confirmation and is confirmed (confirmation is optional).

1.iv The MMI passes this message to the Identity Manager in the handset and the Identity Manager in the handset receives this message

1.v The identity manager in the handset requests the Domain-User Database in the handset to find a record for the keyword "Wife" and the service "Voice Telephony". In the case where multiple users may sequentially use the calling handset, the calling user identity is used to distinguish which record in the Domain User Database is the matching record.

1.vi The Domain-User Database finds a matching record and returns the dialable number "012345 456789" to the Identity Manager in the handset.

1.vii   The Identity Manager in the handset, having received sufficient information from the Domain-User

Database decides that the call can proceed and passes the dialable number to the call manager in the handset, along with a request to set up the call.

1.viii   The call manager in the handset receives the

5   request from the Identity Manager in the handset and then proceeds to set up the call, in the normal way, by sending a call setup request to the node to node controller in the handset.

1.ix The node to node controller in the handset receives

10   the setup request from the call manager in the handset and communicates the request to its peer node to node controller in   the network node.

2   The network node sets up the call in the normal way by performing routing, switching and call control

15   functions. This equipment routes the call to the correct system access point via a suitable node to node Control entity. On this occasion, since the calling user's handset has been able to provide the SAP ID for this call, the Identity Manager and its associated databases in the

20   network node are not invoked.

3.   The called user's terminal/handset in this scenario is just a normal telephone with no additional functionality. the called user's terminal receives the call as normal and delivers the call to the called user.

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Scenario 2 : Sending a file to a remote office for the first time

In this scenario, as illustrated in FIG. 5, the tremendous

30   capability of the present invention is more dramatically

explored. The basic scenario is that a user wishes to send a file to an office for the first time ever. This invention saves the user the trouble of having to manually look up the appropriate SAP ID or other routing information. In

5   addition, once the correct SAP ID or other routing information has been determined by the functionality in accordance with this invention, the calling user's terminal is informed of this new information and is able to store the information for future use.

10

The sequence of events for scenario 2 is as follows:

1.i The calling user has a computer file which he wishes to send to a Motorola sales office in Argentina. His

15   terminal's MMI has a voice input device, so he speaks the words "Send this file to the Motorola Sales Office in Argentina" into the voice input device. (If no voice input device exists, then the calling user can type in the appropriate information, perhaps via a formatted input

20   screen.)

1.ii The MMI contains a speech recognition capability and generates the spoken phrase as a text string.

1.iii The MMI scans the text string and re-formats the information into a message with at least the following

25   fields:

Service = File Transfer

Name = Motorola Sales Office

Organisation = Null

Country = Argentina

30   This interpretation is presented to the user for

confirmation however the user decides to correct the interpretation by saying (or typing) "Organisation is Motorola, Name is Sales Office". The MMI corrects the interpretation according to the new instructions from the

5 calling user.

1.iv The MMI passes this formatted message to the Identity Manager in the terminal and the Identity Manager in the terminal receives this message

1.v The Identity Manager in the terminal requests the

10 Domain-User Database in the terminal to find a record matching the fields Name = Sales Office, Organisation = Motorola, Service = File Transfer, Country = Argentina.

1.vi The Domain-User Database does not on this occasion find any suitable matching record and returns this fact to

15 the Identity Manager in the terminal.

1.vii The Identity Manager, having failed to get a matching response from the Domain-User Database, now analyses the fields of information itself and requests the Search Domain Database in the terminal to find a

20 matching record for Motorola or for Argentina.

1.ix The Search Domain database does not find matching records for either of the requests and reports this fact to the Identity Manager in the terminal.

1.x The Identity Manager in the terminal having no

25 further alternatives, forwards the original formatted inquiry (Name = Sales Office, Organisation = Motorola, Service = File Transfer, Country = Argentina) to the network node 1 via the node to node controller in the Terminal.

2.i The node to node controller in the network node 1 recognises the formatted addressing information and passes this information to the Identity Manager in network node 1, which receives this message.

5   2.ii The Identity Manager in network node 1 requests the network node's Domain-User Database to find a record matching the fields Name = Sales Office, Organisation = Motorola, Service = File Transfer, Country = Argentina.

10   2.iii The Domain-User Database in the network node 1 does not on this occasion find any suitable matching record and returns this fact to the Identity Manager in the network node 1.

2.iv The Identity Manager in the network node 1, having

15   failed to get a matching response from the Domain-User Database in the network node 1, now analyses the fields of information itself and requests the Search Domain Database in network node 1 to find a matching record for Motorola or for Argentina.

20   2.v The Search Domain database finds matching records for both requests and returns records for the on-line Motorola Directory Inquiries server and the on-line Argentina Directory Inquiries Server respectively to the Identity Manager in network node 1.

25   2.vi The Identity Manager in network node 1 receives these two records from the Search Domain Database in network node 1 and prioritises the two alternatives based on an algorithm that includes the cost of searching in the remote systems. In the case of cost-based

30   prioritisation, it turns out that the Motorola Directory

Inquiries server offers a free service, whereas the Argentina server costs $2.00 per search, so the Identity Manager selects the Motorola server and extracts the address of this server from the returned record.

5 (Alternatively the selection from these two alternative can be performed by the calling user himself. This would require the alternatives to be sent back up the chain and presented to the calling user.)

2.vii   The Identity Manager in network node 1
10 forwards the original formatted search request (Name = Sales Office, Organisation = Motorola, Service = File Transfer, Country = Argentina) to the appropriate node to node Control entity which is able to communicate the request to the on-line Motorola Directory Inquiries
15 server.

3.i The node to node controller in the Motorola Directory Inquiries server (MDE) recognises the formatted addressing information and passes it to the Identity Manager in the MDE server, which receives this message.

20 3.ii The Identity Manager in the MDE requests the Domain-User Database in the MDE to find a record matching the fields Name = Sales Office, Organisation = Motorola, Service = File Transfer, Country = Argentina.

3.iii The Domain-User Database finds a matching record
25 and returns the matching record to the Identity Manager in the MDE.

3.iv The Identity Manager in the MDE is not able to set up the call to the Motorola Sales Office in Argentina, since it does not have a suitable node to node controller, so the

matching record is returned to network node 1 via the appropriate node to node controller.

2.viii   The node to node controller in network node 1 receives the record and passes it to the Identity Manager
5   in network node 1.

2.ix The Identity Manager in network node 1 extracts the appropriate SAP ID and/or routing information from the record and instructs the call manager in network node 1 to set up the appropriate call. The Identity Manager in
10   network node 1 also transmits the matching record back in the direction of the calling user's node via the appropriate node to node controller.

1.xi The matching record is received in the calling user's terminal via the node to node controller in that terminal.
15   The node to node controller passes this record on to the Identity Manager in the terminal.

1.xiiThe Identity Manager in the terminal receives this record, and instructs the Domain-User Database in the terminal to store the new record.
20   1.xiii   The Domain-User Database in the calling user's terminal stores the new record for future use.

Note: the address of the Motorola Directory Inquiries service may also be returned to the calling user's
25   terminal, where it would be stored in the Search Domain Database. Future requests by this user for communications to Motorola could then bypass the identity matching functions of the network node and directly ask the Motorola Directory Inquiries equipment.

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2.viii   The call manager in network node 1 sets up the service connection via a second network node (4) in Argentina to the Sales Office Equipment in Argentina (5) and the service is executed.

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Other foreseeable services provided in the preferred embodiment.

Restricted Access (e.g. Ex-directory)

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It would be essential that users identities such as "The Queen at Buckingham Palace" are not abused. The equivalent of going ex-directory must be supported in by this invention. This is achieved by having a field entitled 15 "Access Control Rule" in each record of the Domain-User Database. In this field is stored a password, DTMF sequence, authentication and encryption rule or whatever means of security the called user employs to protect against unwanted callers. In the case of password 20 protection, no record will be returned by the Domain-User Database without the correct password being supplied. In this way the called user can prevent malicious calls by only providing the password information to selected other users. Some agencies such 25 as the police may not be required to provide the password for obvious reasons.

Route Selection

It may be possible that one called user may have multiple subscriptions for the same or similar services. For example a user may have a fixed telephone line subscribed through one network operator and a mobile phone subscribed through another network operator, both of which are capable of delivering the voice telephony service. The choice of which network to select (i.e. which SAP ID) as the matching SAP ID for the called user id made by the Identity Manager, based upon some algorithm such as minimum cost, maximum likelihood of success, voice quality, etc. The various alternatives are stored in priority order in the "Prioritised dialable Number(s)" field of each record in the Domain-Users Database.

Furthermore, there may be multiple routes available for setting up the call to a specific SAP ID - this manifests itself amongst other things in the determination of which node to node controller is selected during call setup. The various routes are prioritised according to some algorithm such as minimum cost, maximum quality, etc. This priority can change according to time of day or some other algorithm and this information is stored in the field named "Prioritised List of Gateway Domains".

Intelligent Re-Routing for Roaming Called Users

Although the called user may be known to the calling user by a particular user identity, such as "Bill Robinson at Motorola, UK", the information stored in the Domain-

User Database can be used to re-route calls to the called
user in circumstances where the called user has roamed
to an alternative location, (e.g. traveled to another
network in another country). The Identity Manager in
5   one of a suitable nodes intercepts the call setup process
and re-routes the call setup to the new destination, the
location of which is provided by a record in the Domain-
User Database.

10   Access to User's Home Databases from Another Terminal

The user's own Domain-User Database and Search Domain
Database may be stored in a removable User Identity
Module, such as a SIM card or equivalent. If this is the
15   case, when the user roams to a remote location and uses
different terminal, he simply inserts his SIM into the
terminal in the normal way and all his own database
information is available to him.

20   Where it is the case that the Domain-User Database and
Search Domain Database are stored in the user's terminal,
and not in a removable SIM, the method of accessing the
user's own databases from a remote location must clearly
be different. In this case, the user knows that his own
25   database contains certain records   that may not be
present in the remote terminal he is using. In order to
reduce the cost and time penalty incurred by searching
for routing information pertaining to a specific called
user through successive databases in various network
30   nodes, the user can instruct the search to be performed

controller for accessing one of a plurality of network nodes; and

a first network node for receiving a communication requests from the first communication terminal and

5 providing a service chosen from the group consisting of SAP ID communication to the first communication terminal, communication set-up between the first communication terminal and the second communication terminal using the desired SAP ID, and communication of

10 the communication request to a second network node.

7. A communications addressing network in accordance with claim 6 wherein the first communication terminal further comprises:

15 a man-machine interface (MMI) for interfacing to the first user and generating the communication request;

an identity manager for identifying the SAP ID in response to the communication request from the MMI;

a domain-user database for use by the identity

20 manager for searching for the SAP ID using the communication request;

a search domain database for use by the identity manager for searching for alternate search domains for searching for the SAP ID using the communication

25 request; and

a call manager for communicating to the second communication terminal via the SAP ID provided by the identity manager.

8. A communications addressing network in accordance with claim 7 wherein the communication requests further comprises a message having at least one field chosen from a group consisting of Service Type, Organization, Country, and Name.

9. A communications addressing network in accordance with claim 8 wherein the Service Type includes a predetermined service type chosen from a group consisting of voice service, data service, video service, and file transfer service.

10. A communications addressing network in accordance with claim 7 wherein the domain-user database has a plurality of SAP ID records, wherein each SAP ID record at least one field chosen from a group consisting of SAP ID, User Name, Organisation, Access Control Rule, Address, Prioritised Dialable Number's Present Domain ID, Service, Charging Information, and Prioritised List of Gateway Domains.

11. A communications addressing network in accordance with claim 7 wherein the MMI further comprises means for transforming a user input into a communication request, said means for transforming including transforming the user input from a first media type to a text media and formatting the user input into a predetermined communication request format.

12. A communications addressing network in accordance with claim 6 wherein the first network node further comprises:

an identity manager for identifying the SAP ID in response to the communication request from the first communication terminal;

a domain-user database for use by the identity manager for searching for the SAP ID using the communication request;

a search domain database for use by the identity manager for searching for alternate search domains for searching for the SAP ID using the communication request; and

a call manager for communicating to the second communication terminal via the SAP ID provided by the identity manager.

13. A communications addressing network in accordance with claim 12 wherein the first network node further comprises a network-manager interface (NMI) for modifying information contained in the domain-user database or the search domain database.

Patents Act 1977		*27*	Application number
Examiner's report to the Comptroller under Section 17			GB 9522667.6
(The Search report)			

Relevant Technical Fields	Search Examiner **AL STRAYTON**
(i) UK Cl (Ed.N) **H4K: KBNJ; KFH**	
(ii) Int Cl (Ed.6) **H04M**	Date of completion of Search 24 JANUARY 1996
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications.	Documents considered relevant following a search in respect of Claims :- 1-5
(ii)	

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

A: Document indicating technological background and/or state of the art.

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Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2226675 A	(TOSHIBA) entire document	1-5
X	GB 2212365 A	(RICOH) entire document	1-5
X	GB 2113043 A	(CITY COMPUTER) entire document	1-5
X	EP 0618710 A	(US WEST) entire document	1-5
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